MEDICAL RESEARCH ACTIVITIES OVERSEAS*

GUSTAVE J. DAMMIN

Pathologist-in-Chief
Peter Bent Brigham Hospital

Elsie T. Friedman Professor of Pathology
Harvard Medical School

Boston, Mass.

THE time for an analysis of medicine and diplomacy in the tropics is now. I congratulate Dr. Kevin M. Cahill for having planned this symposium and I thank him for including me among the participants. As workers in the health and medical fields, we are more needed in the tropical countries today than ever before. For those of us who were planning our international health programs a decade ago, today must be a sad day, for there has been a great reduction in funds for health and medical research programs in general and for work in the tropical countries in particular. Because of the reduced financial support for overseas programs, I believe that we have been forced into a two-phase effort: today's, for the development of our plans, and tomorrow's, for their implementation. We must pursue our planning in the hope that the day when overseas work can be resumed and new momentum generated by it will be in the foreseeable future. We must see progress soon because there is an urgency about reviving programs now in limbo and initiating new ones, in part because of the broad drive among today's youth to work with the unfortunates of the developing countries in the tropics. This urge to serve is very evident among today's medical and health-science students, and it is a relatively new phenomenon. We should respond to it so that when today's younger students of medicine and the other health sciences are ready to apply themselves in their professional capacities we shall be prepared with plans, programs, and funds.

The extension of medical and health aid by this country to the developing countries of the tropics has been viewed by those countries

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in various lights. However, almost irrespective of its origin—whether the assistance has been offered by governmental, industrial, philanthropic, religious, or other agency—such aid in general has been welcomed and accepted in the light in which it has been offered. Until a few years ago our allocations of funds for overseas medical research were still expanding. We are now at the end of a decade which began with a breadth of national purposes that included the extension of our medical knowledge and wherewithal to the many developing countries so badly in need of them. It was in 1959 that the National Academy of Sciences-National Research Council (NAS-NRC) undertook, as Dr. Keith Cannan summarized it, "a study of the needs and resources for research in the broad field of tropical health."[1] When the study was published in 1962, Dr. Albert Sabin recorded in its preface the collective opinion of his group, the NAS-NRC Advisory Committee on Tropical Medicine:

> It is an inescapable fact that history, having brought the United States to a position of leadership in the world, has imposed on it a responsibility to support the efforts of other peoples to improve their health and welfare.[2]

The Committee also noted:

> Specifically there is need to establish authority to support research on problems that are important as problems of the tropics and not because their solutions may contribute indirectly to the health of the people residing in the United States.[3]

It was during the deliberations of the committee on the problems of tropical health that the International Health Research Act of 1960 was passed; this stimulated a substantial increase in research activities in this field. Unfortunately the last years of this decade have seen a serious reduction in such support, and to a level from which recovery will be slow, difficult, and costly.

Planning for tomorrow requires that we know about past efforts, especially those of the recent past, since we must plan for a world which is in many ways new. The United Nations, which now represents 126 countries, tells us in one way how new today's world is. As we look for guidance on the development of overseas medical research programs we find that medical research itself is a relatively new development in this country.[4, 5] In writing about the beginnings of organized medical research in the United States, Sigerist[6] set the date as

1893, the year in which the Johns Hopkins Medical School was opened. Shryock,[7] a fellow medical historian, chose 1895 as the year in which American medical research entered its independent stage; previous efforts in American medical research had been dominated in succession by Great Britain, France, and Germany. There can be little dispute with this choice of dates if one refers to the beginnings of independent and organized medical research in this country. However, there had been occasional American medical research efforts that were truly pioneering, neither prompted nor guided from abroad. In this category belongs the work of William Beaumont, the first and the leading American clinical investigator for many years. Beaumont's studies of gastric function more than 100 years ago led Sir William Osler to describe him as "The pioneer physiologist of the United States and the first to make a contribution of enduring value, his work remains a model of patient, persevering research."[8]

A search for the beginnings of American medical research overseas shows that they coincided with the first military effort that took large numbers of American troops overseas, namely, the Spanish-American War. It was the scientific developments of the latter decades of the 19th century that provided the stimulus to examine the infectious diseases that assumed such great importance in the tropics. The bacteriological discoveries in France and Germany were cheered and welcomed in this country, and by no one with more enthusiasm than George Miller Sternberg, Surgeon General of the Army from 1893 to 1902. General Sternberg exploited these discoveries to benefit American medicine and launched the "bacteriological era" in this country. He founded the Army Medical School soon after his appointment as Surgeon General and appointed the Reed-Vaughn-Shakespeare Typhoid Board in 1898 and the Walter Reed Yellow Fever Commission in 1900. He was responsible also for research programs in the tropical diseases of the Philippines and of Panama.[9] Thus, armed with the newer methods for the investigation of the infectious diseases of the tropics, the army took the lead in epidemiological and laboratory research on the major bacterial, viral, mycotic, and parasitic diseases of the tropics.[10]

That was certainly another time and another day. The leaders in military medicine—Sternberg, along with Walter Reed, John Shaw Billings, and William Gorgas among others—ranked in eminence with

the outstanding figures in medicine of that day: Osler, Pepper, Welch, Councilman, Delafield, and Fitz.[11] Their associations through common interests were such that whatever distinctions may have existed between military medicine and medicine in that day are not perceptible today.

It should be noted that the then newly organized Association of American Physicians held its first annual meeting, in 1886, in Washington, D.C., in the reading room of the Army Medical Museum. It was at this meeting that Councilman presented a paper on certain elements found in the blood in malarial fever. Councilman suspected that by staining he had demonstrated the plasmodia of malaria. Osler, in his discussion of Councilman's paper, drew on the blackboard the structures he had seen in fresh preparations of the peripheral blood which he thought to be vacuoles rather than organisms in the erythrocytes. Sternberg entered the discussion and sided with Councilman against Osler; he stated that by staining the red cells parasites and not vacuoles could be visualized.[12] Sternberg mixed not only with this elite group, but ultimately rose to the presidency of both the American Medical Association and the American Public Health Association.

Although work on the diseases of the tropics continued in this country and abroad during the early decades of the present century, efforts to continue overseas research stations did not thrive, and few survived. Not until 1939, when a limited national emergency was proclaimed by President Franklin D. Roosevelt, were plans developed for a resumption of overseas work. Early in 1941 the Surgeon General of the Army announced the establishment of a system of corps area and department laboratories.[13] These were to be essentially public health laboratories for field and laboratory research. The former were to serve the corps areas in the continental United States and the latter were to be located in the Canal Zone, Puerto Rico, Hawaii, and the Philippines. In the Canal Zone the Gorgas Hospital and the adjacent Board of Health Laboratory together served the Panama Canal Department as a Department Laboratory. For the Puerto Rican Department a laboratory building was constructed in San Juan. This was begun in mid-1941 and opened for service in February 1942. In Hawaii and the Philippines existing laboratory facilities were designated as Department Laboratories. However, the Hawaiian Department became part of a larger command and was served first by a Medical Field Laboratory and then a Medical General Laboratory. Because of enemy action, the

Philippine Department was never served by a Department Laboratory although the services of such a laboratory would have been provided by the Sternberg General Hospital in Manila. With World War II under way, a wide variety of medical laboratories served in tropical areas. The army had Medical General Laboratories in Hawaii and the southwest Pacific, and half of its Medical Field Laboratories were stationed in tropical areas. The navy established its famous Naval Medical Research Unit No. 2 (NAMRU-2) on Guam, and one of the army's medical field laboratories, the well-known 406th Medical Laboratory, was stationed first in the Tokyo-Yokohama area and then transferred to Zama, west of this area. The build-up of overseas installations continued after the end of World War II, and NAMRU-3 was established near Cairo. NAMRU-2 was reactivated and located in Taipei. The army, in coordination with the Southeast Asia Treaty Organization, set up a research laboratory in Bangkok, Thailand; and in Malaysia a medical-research institute was activated near Kuala Lumpur. The air force inaugurated its epidemiological flight-laboratory system with so-called "epi flights" at Clark Air Force Base in the Philippines and in Izmir, in western Turkey.

This brings us almost to the beginning of the present decade when a unit of the Southeast Asia Treaty Organization (SEATO) laboratory in Bangkok was moved to Dacca, East Pakistan, under the auspices of the State Department and of the National Institutes of Health (NIH), with support from the governments of Pakistan and the United Kingdom. Founded in 1960 as the Pakistan-SEATO Cholera Research Laboratory, the unit has a record of remarkable achievement in the development of newer diagnostic and management procedures and in its studies of the pathogenesis, epidemiology, and control of cholera. This was also the time of the launching of the International Centers for Medical Research and Training (ICMRT) in Calcutta, India; Lahore, West Pakistan; Cali, Colombia; Kuala Lumpur, Malaysia; and San José, Costa Rica. These centers were organized and staffed by American medical schools and funded by the National Institutes of Health. At this time also, funds were increased for the congressionally funded Gorgas Memorial Laboratory in the Republic of Panama, and the Middle America Research Unit was organized by the army and the NIH and installed in the Canal Zone. The Institute for Nutrition in Central America and Panama (INCAP) was founded earlier with assist-

ance from the Pan American Health Organization but then, for a period, also received funds from the National Institutes of Health and the U. S. Army Medical Research and Development Command.

It is clear from a survey of present efforts of governmental agencies that the peak of our commitment and activity in overseas medical research has passed, and that the decline is continuing at a worrisome rate. We should heed the urging of the National Academy of Sciences-National Research Council Advisory Committee on Tropical Medicine, mentioned earlier, to establish an authority which could organize our efforts both here and abroad; we could thereby restore the position of this country in international health research and recapture much of the esteem and goodwill of the rest of the world.

In this summary of overseas medical research I have concentrated on the work of our governmental agencies only because their programs have been so much more familiar to me. More detailed accounts of some of their notable achievements are contained in Dr. Williams' history of the Public Health Service,[14] Dr. Corner's account of NAMRU-2 in his *History of The Rockefeller Institute*,[15] and in a historical review of the army's medical laboratories.[16]

The substantial contributions of agencies not supported by governmental funds are widely known. The outstanding programs of the Rockefeller Foundation in international health research were cited in the National Academy of Sciences-National Research Council's report, *Tropical Health*. The high cost of this important report was shared by the foundation, the National Institutes of Health, and the U. S. Army Medical Research and Development Command; these organizations in concert served as sponsors of the report. Other contributors to the study were the Pan American Health Organization of the World Health Organization (WHO), the Pharmaceutical Manufacturers Association, and the Louisiana State University School of Medicine. The director of the staff that conducted the study was Dr. Willard H. Wright. In referring to sources of information on the several major categories of tropical diseases, Dr. Wright cited the great value of the epidemiological reports of WHO and the epizootiological data published by the Food and Agricultural Organization (FAO). Since the preparation of its report, *Tropical Health*, WHO has shown increasing leadership in the fields covered by the report and has planned larger financial outlays for the coming years.[17]

Over-all funding of tropical-health research about 10 years ago was not large, but was rising. The average annual expenditure of funds from federal sources for the five-year period ending in 1958 was about $6 million, of which almost three fourths was for intramural research. This annual expenditure represented less than 3% of the total allotted from federal sources for biomedical research. In the medical schools tropical health research comprised an even smaller percentage of total biomedical research, somewhat over 1%. The country's drug companies were expending over $5 million per year for tropical health research, and the country's largest private institution, the Rockefeller Foundation, allotted over $1 million for such research.

The recent reduction of funds from federal sources has been accompanied, fortunately, by a rising interest and support from the country's larger foundations and corporations. This encouraging movement is exemplified by the number of private sources which are identified with financing the construction of a health-sciences laboratory building for the Harvard School of Public Health and the funding of some of this school's overseas programs. Helping in the former venture are the Colonial Research Institute, the Rockefeller Foundation, the Kresge Foundation, the John A. Hartford Foundation, and the Wellcome Trust. Among the contributing corporations are the country's leading industrial, banking, and drug companies. In the accompanying table are listed governmental and other contributors to the tropical-health programs sponsored by the Harvard School of Public Health. This tabulation is presented only as a sample of the activities of one educational institution interested in tropical health problems, and this school is selected primarily because of my familiarity with its programs.

There still exist today many of the overseas installations that had their beginnings almost a decade ago. The programs of most have been curtailed and some have been inactivated. Each of these research installations represents an enormous investment in persons and in their careers in the health sciences, in programs, and in goodwill—an investment which should be protected. Support for these installations should be increased so that they can pursue their missions and obligations in the respective geographic areas they serve. However to assure their continued operation, these installations would have to be part of an over-all plan for funding overseas medical research so that a resetting of priorities within any one organization would not jeopardize the op-

Country	*Program*	*Consultant and/or participant institutions*	*Financial sponsor*
North and Central America			
Canada	Mental health in rural communities	Digby-Annapolis Mental Health Centre, Nova Scotia	NIMH
Bahamas	Tropical public health; family planning clinic; mosquito control studies	Colonial Research Institute	CRI, GRSG
Puerto Rico	Maternal and child health	University of Puerto Rico, Department of Preventive Medicine and Public Health	USPHS, WHO, Children's Bureau and other sources
Haiti	Tropical public health; population studies and family planning clinic	Hôpital Albert Schweitzer	HSPH
Mexico	Rickettsial infections	Instituto de Salubridad y Enfermedades Tropicales	Commission on Rickettsial Diseases, AFEB
South America			
Chile	Epidemiology of abortion; evaluation of fertility control program	University of Chile Medical School, Department of Preventive Medicine	The Rockefeller Foundation
Brazil	Training program for medical students in tropical medicine	University of Bahia Medical School, Bahia	NIAID, USPHS
Colombia	Training program for medical students in tropical nutrition	University of Antioquia (Medellin); National Institute of Nutrition (Bogota)	NIH, AMA
Yugoslavia	Rickettsial infections	Faculty of Medicine, Sarajevo	Commission on Rickettsial Diseases, AFEB
The Middle East and North Africa			
Israel	Nutrition	Hadassah Medical School, Department of Nutrition, Hebrew University	Julian Mack Fund
	Epidemiology of heart disease in siblings	Hadassah Medical School, Department of Medical Ecology, Hebrew University; Israel Institute of Applied Social Research	GRSG, NHI
Lebanon	Trachoma	American University of Beirut, Department of Ophthalmology and Epidemiology	NIAID
Tunisia	Relation between economic development and public health	University of Tunis; Ministries of Health, Education and Foreign Affairs	AID
Saudi Arabia	Trachoma	Arabian American Oil Company, Medical Department	ARAMCO
Asia			
Ceylon	Health care of mothers and children in a rural demonstration area	Department of Preventive Medicine, University of Ceylon	Social and Rehabilitation Service, Children's Bureau
India	Population pressure and health	All-India Institute of Medical Sciences	Ford Foundation, HSPH
	Population analysis in Ganges-Bramaputra Basin	Officials of Governments of India and Pakistan	HSPH

eration of an overseas unit and thereby the over-all plan. At the present time and in the recent past there have been government-supported tropical-health research activities in Japan, East and West Pakistan, India, Panama, Colombia, Costa Rica, Malaysia, Thailand, the Philippines, Taiwan, Turkey, and Egypt. The funding of their programs is determined largely by the mission of the governmental agency responsible for each. Unfortunately, as emphasis on certain components of the mission may change, so will financial support for an activity be altered. It would seem wise therefore, for the future of this government's position in international health research, to have one agency, preferably a nongovernmental one, take the leadership in organizing our assets and capabilities, to assure an optimal breadth of operations in our overseas installations, and to seek to establish others where needed. The Advisory Committee on Tropical Medicine of the National Academy of Sciences-National Research Council saw the need for such an organization and recommended that the academy itself, with its Council, establish a "national program for National research in tropical health." Such a move by the Academy would give a program its most appropriate support and would be in essential accord with the proposal made earlier in this symposium by Dr. John S. Badeau, director of the Middle East Institute.

In closing this review of our country's medical research activities overseas, I must place considerable emphasis on the importance of a matter which, a decade ago, was only beginning to receive attention: namely, control of population. In the developing countries this matter deserves as much attention as the control of infectious diseases and the drive for better nutrition. We must recognize what has been accomplished by the containment of some of the mass-killing diseases and how much of a hazard to world stability and peace the continued increase in the world's population would be if it were concentrated in the economically most depressed areas. The emphasis on family planning and control of population must be even greater today. A grim forecast of the consequences of a lack of planning were well expressed by Dr. Sabin in his report when he stated:

> . . . there are many who believe that the continued acquisition and application of knowledge designed to prolong life and to eliminate the miseries and handicaps of disease, without comparable concurrent activities directed at fertility control, will in

effect, before long, result in the even greater miseries of hunger, poverty and war, and thereby create the greatest potential threat to human survival in all parts of the world.[18]

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